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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,304	12/13/2001	Ravindra M. Kapre	01-721/LSI1P185	8043

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LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106 LEGAL
MILPITAS, CA 95035

EXAMINER

SEFER, AHMED N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 08/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

CTN

Office Action Summary	Application No. 10/020,304	Applicant(s) KAPRE ET AL.	
	Examiner A. Sefer	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-27 is/are rejected.
- 7) ☒ Claim(s) 28-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/7/03 has been entered; claims 1-9 and 22 have been cancelled and new claims 27-31 have been added.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 23 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harington, III USPN 5,688,722 in view of Kusunoki USPN 6,066,880.

Harington, III discloses in figs. 1-7 an integrated circuit fabricated on a semiconductor substrate and having at least two devices, each having a different gate oxide thickness, the circuit comprising a first device 14 having a first gate 22 disposed on a gate dielectric layer 320 having a first thickness and a first effective gate dielectric value and disposed on the semiconductor substrate; a second device 16 having a second gate 24 disposed on a gate dielectric layer having the first thickness and the first effective gate dielectric value, the gate dielectric layer fabricated on a semiconductor substrate, a buried channel 26 implanted below the

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gate dielectric layer, the buried channel being doped with a predetermined dopant of a first conductivity type and a peak concentration of the dopant positioned at a selected level in the substrate of a second conductivity type below the gate dielectric layer, wherein the effective gate dielectric of the second device is a predetermined value greater than the first effective gate dielectric value, but do not specifically disclose the dopant concentration acting as a supplemental gate dielectric layer to increase effective dielectric thickness.

Kusunoki discloses (see figs. 68-79 and 42-46, col. 8, lines 4-10) a buried channel being doped with a predetermined dopant acting as a supplemental gate dielectric layer to increase effective dielectric thickness.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teachings of Kusunoki, so that breakdown voltage of the channel can be controlled while effective dielectric thickness is being increased.

As to claim 25, Kusunoki discloses a MOS capacitor device.

As to claim 26, Kusunoki discloses a p-type substrate and an n-type buried channel.

As to claim 27, Harrington, III discloses a n-type substrate and an p-type buried channel.

4. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harrington, III in view of Kusunoki as applied to claim 23 above, and further in view of Kizilyalli USPN 5,767,557.

The combined references fail to disclose peak concentration of implanted dopants in the buried channel located below the interface.

Kizilyalli discloses (see col. 5, lines 6-19) an insulating gate dielectric layer and a substrate forming an interface and a peak concentration of implanted dopants in the buried

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channel located within a few hundred angstroms below the interface, which falls within the range recited in the claim.

Therefore, it would have been obvious to incorporate the teachings of Kizilyalli, since that would provide a reduced channel punch-through as taught by Kizilyalli.

Allowable Subject Matter

5. Claims 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (703) 605-1227.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601.

ANS
August 11, 2003

NATHAN J. FLYNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

